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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/720,762	11/25/2003	Tae-gyu Chang	Q77359	2773

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SUGHRUE MION, PLLC
2100 PENNSYLVANIA AVENUE, N.W.
SUITE 800
WASHINGTON, DC 20037

EXAMINER	
GODBOLD, DOUGLAS	

ART UNIT	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/720,762	CHANG ET AL.	
	Examiner	Art Unit	
	Douglas C. Godbold	2626	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on *11 July 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3,8-10 and 15-17* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *8-10* is/are allowed.

6)☒ Claim(s) *1-3 and 15-17* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This Office Action is in response to correspondence filed July 11, 2007 in references to application 10/720,762.

Response to Amendment

2. Amendments filed July 11, 2007 have been considered and accepted in this office action. Claims 4-7 and 11-14 have been cancelled, and the amended claim 8 has bee accepted.

Response to Arguments

3. Applicant's arguments, see Remarks, filed July 11, 2007, with respect to the rejection of claims 8-10 under 35 U.S.C 112, 2nd paragraph have been fully considered and are persuasive. The rejection of claims 8-10 under 35 U.S.C. 112 has been withdrawn.

4. Applicant's arguments, see Remarks, filed July 11, 2007, with respect to the rejection of claims 15 and 17 under 35 U.S.C. 101 have been fully considered and are persuasive. The rejection of claims 15 and 17 under 35 U.S.C. 101 has been withdrawn.

5. Applicant's arguments filed July 11, 2007 with respect to the rejections of claims 1-3 and 15 under 35 U.S.C 103(a) have been fully considered but they are not persuasive.

The applicant argues that attenuating the quantization noise m bands where the quantization noise is than the noise threshold does not necessarily disclose attenuation wherein the differences between the predetermined quantization noise threshold and the quantization noise energy of the quantized MDCT coefficients are relatively large (amendment, pages 9 and 10).

The examiner respectfully disagrees. While it is true, as the applicant pointed out, that Subramaniam teaches shaping noise above the noise threshold, it is inherent that the sub-bands in which the quantization noise is significantly higher than the threshold would be shaped as well. In fact, Subramaniam teaches that all noise over the noise threshold will be shaped, not just the noise significantly over. The language of claim 1 and claim 15 does not limit the shaping to those sub-bands that have a significant difference, but rather teaches that the sub-bands with a significant difference will be shaped. Sub-bands that have a smaller difference than "relatively large" are not excluded in the claim language, and therefore Subramaniam teaches this limitation.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. Claims 1-3 , and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Subramaniam et al. (US Patent 6,950,794) in view of Kawahara (US Patent 6,697,775).

9. Consider claim 1, Subramaniam teaches a method of shaping quantization noise (figure 4), comprising:

receiving a predetermined quantization noise threshold allowed during quantization of sampled audio data (mask thresholds 31 are received from psychoacoustic models; column 8, lines 10 - 13) and quantization noise energy information of quantized MDCT coefficients of a plurality of frequency bands of an audio frequency range (this would be included in transform coefficients, called distortion in this reference); and

attenuating quantization noise energy of quantized MDCT coefficients of the plurality of frequency bands (figure 4 shows a bit allocation method where scale band factors are used to shaped the noise in the subbands; column 8, lines 4- 52.), wherein

differences between the predetermined quantization noise threshold and the quantization noise energy of the quantized MDCT coefficients are relatively large (This algorithm is would inherently attenuate the quantization noise in bands where the quantization noise is higher than the noise threshold.)

However Subramaniam does not specifically teach that this algorithm is carried out on a predetermined number a plurality of frequency bands.

In the same field of audio coding, Kawahara teaches attenuating a predetermined number a plurality of frequency bands (figure 5 shows only subbands 0-15 are selected for psychoacoustic allocation means; in figure 6, only 0-7 are selected.).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to only apply the psychoacoustic allocation as taught by Subramaniam to only a select number of bands, as taught by Kawahara, in order to increase coder efficiency (Abstract, Kawahara).

10. Consider claim 2, Subramaniam teaches the method of claim 1, wherein the predetermined quantization noise threshold is calculated in a psychoacoustic model (Thus, the process begins at figure 4, blocks 30 and 31 by receiving the transform coefficients of the analog samples and the predetermined masking thresholds provided by the psychoacoustic model; column 8 line 10.).

11. Consider claim 3, Subramaniam teaches the method of claim 1, wherein the quantization noise energy is attenuated by increasing a scale factor band gain (At figure

4, block 33, the minimum scaling (A_{sfb}) required for each scale factor band is determined such that the distortion for a given band is less than the corresponding mask value; column 8, line 13. Scaling is the same operation as adjusting the scale factor gain.).

12. Consider claim 15, Subramaniam teaches a computer-readable recording medium for recording a computer program code for enabling a computer to provide a service of executing a quantization noise distribution adjustment method (The present invention may be implemented on a data processing system by providing suitable program instructions, consistent with the foregoing disclosure, in a computer readable medium; column 9, lines 26 - 29), the service comprising the steps of receiving a predetermined quantization noise threshold allowed during a quantization of sampled audio data (mask thresholds 31 are received from psychoacoustic models; column 8, line 10) and quantization noise energy information of quantized MDCT coefficients of a plurality of frequency bands of an audio frequency range (this would be included in transform coefficients, called distortion in this reference) and attenuating quantization noise energy of quantized MDCT coefficients of the plurality of frequency bands (figure 4 shows a bit allocation method where scale band factors are used to shaped the noise in the subbands; column 8, lines 4- 52.), wherein differences between the predetermined quantization noise threshold and the quantization noise energy of the quantized MDCT coefficients are relatively large (This algorithm is would inherently

attenuate the quantization noise in bands where the quantization noise is higher than the noise threshold.)

However Subramaniam does not specifically teach that this algorithm is carried out on a predetermined number a plurality of frequency bands.

In the same field of audio coding, Kawahara teaches attenuating a predetermined number a plurality of frequency bands (figure 5 shows only subbands 0-15 are selected for psychoacoustic allocation means; in figure 6, only 0-7 are selected.).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to only apply the psychoacoustic allocation as taught by Subramaniam to only a select number of bands, as taught by Kawahara, in order to increase coder efficiency (Abstract, Kawahara).

1. Claims 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Subramaniam et al. in view of Kawahara as applied to claim 1 above and further in view of Najafzadeh et al. (Perceptual Bit allocation for Allocation for Low Rate Coding of Narrowband Audio).

2. Consider claim 16, Subramaniam in view of Kawahara teaches the method of claim 1, however does not specifically teach that the differences are first differences which are relatively larger than second differences between the predetermined quantization noise threshold and the quantization noise energies of the quantized MDCT coefficients not in the predetermined number of frequency bands.

In the same field of audio coding, Najafzadeh teaches that the differences are first differences which are relatively larger than second differences between the predetermined quantization noise threshold and the quantization noise energies of the quantized MDCT coefficients not in the predetermined number of frequency bands (Page 895, the section titled "total audible distortion technique" discusses allocating bits to each band depending on how much it reduces the total distortion. In this way bits are obviously allocated to bands with the greatest noise to mask ratios in order to reduce the overall distortion by the greatest amount.).

Therefore it would have been obvious to one of ordinary skill in the art to reduce the noise in the bands that would reduce the overall distortion the most as taught by Najafzadeh with the encoding method of Subramaniam in view of Kawahara in order to provide a more efficient encoder that produces the minimum audible distortion.

3. Consider claim 17, Subramaniam in view of Kawahara teaches computer-readable medium of claim 1, however does not specifically teach that the differences are first differences which are relatively larger than second differences between the predetermined quantization noise threshold and the quantization noise energies of the quantized MDCT coefficients not in the predetermined number of frequency bands.

In the same field of audio coding, Najafzadeh teaches that the differences are first differences which are relatively larger than second differences between the predetermined quantization noise threshold and the quantization noise energies of the quantized MDCT coefficients not in the predetermined number of frequency bands

(Page 895, the section titled "total audible distortion technique" discusses allocating bits to each band depending on how much it reduces the total distortion. In this way bits are obviously allocated to bands with the greatest noise to mask ratios in order to reduce the overall distortion by the greatest amount.).

Therefore it would have been obvious to one of ordinary skill in the art to reduce the noise in the bands that would reduce the overall distortion the most as taught by Najafzadeh with the encoding method of Subramaniam in view of Kawahara in order to provide a more efficient encoder that produces the minimum audible distortion.

Allowable Subject Matter

4. Claims 8-10 allowed.

5. The following is an examiner's statement of reasons for allowance: The prior art of Subramaniam and Kawahara or a combination of the prior art does not teach nor fairly suggest the limitations calculating a number of bits used for the Huffman-coding, and setting the number of bits to use a number of bits smaller than the calculated number of bits in order to control a bit rate; and

determining whether a scale factor band gain has increased in the plurality of frequency bands, and if the scale factor band gain has increased in the plurality of frequency bands, ending the shaping quantization noise energy using the stored scale factor.

The prior art of record does not teach not fairly suggest these limitations, nor does any combination of the prior art.

Claims 9 and 10 are allowed as they are dependent on claim 8 and further limit the claim.

Conclusion

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Douglas C. Godbold whose telephone number is (571) 270-1451. The examiner can normally be reached on Monday-Thursday 7:00am-4:30pm Friday 7:00am-3:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Edouard can be reached on (571) 272-7603. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

DCG

TALIVALDIS IVARS SMITS
PRIMARY EXAMINER